Composting Facility Guidelines

NOVA SCOTIA

Environment and Labour

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Approved By: William Lahey

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I. GENERAL

1. Purpose

(a) The purpose of these guidelines is to provide for the proper environmental management of composting facilities.

(b) These guidelines also provide guidance as to the requirements to obtain an approval to construct and operate a composting facility.

(c) Refer to Schedule A for the definition of terms used in these guidelines.

(d) Final assessment of applications for the construction and operation of a composting facility will be made on a case by case basis.

(e) For further information respecting these guidelines, contact Nova Scotia Environment and Labour's Regional/District office where the site is located.

2. Applicable Documentation

These guidelines should be used in conjunction with the following:

(i) *Solid Waste Resource Management Strategy (1995)*
(ii) *Environment Act*
(iii) *Solid Waste-Resource Management Regulations*;
(iv) *Activities Designation Regulations*
(v) *Approvals Procedure Regulations*

3. Applicability

(a) These guidelines apply to all composting facilities requiring approval under Section 27 of the *Solid Waste-Resource Management Regulations*, which state:

> 27 No person shall construct, operate, expand or modify a facility which can process compost without obtaining approval from the Minister.

(b) These guidelines do not apply to:

(i) backyard composting

(ii) generally accepted farming activities

(iii) the composting of leaf and yard waste where not more than 100 m^3 is produced annually

II. APPLICATION FOR APPROVALS

1. Application

(a) Prior to construction of a composting facility, an approval must be granted by the department pursuant to Section 27 of the *Nova Scotia Solid Waste-Resource Management Regulations*.

(b) Applications for approval to construct, operate, expand or modify a composting facility must be accompanied by a letter from the municipal unit where the facility is to be located stating that the facility meets zoning, planning restrictions and such other by-laws as may exist.

(c) Unless specifically exempted by the administrator, the applicant is to provide all information necessary to satisfy the requirements of each of the following sections.

III. LEAF AND YARD WASTE COMPOSTING FACILITIES UNDER 10,000 TONNES

1. General

Section III of the guidelines applies to composting facilities which process only leaf and yard waste and utilize up to a maximum of 10,000 tonnes annually of feedstock.

2. Facility Design and Construction

(a) The composting facility shall incorporate the following requirements:

(i) systems shall be designed to minimize odour generation

(ii) measures shall be taken to control/treat leachate and storm runoff and prevent groundwater contamination

(iii) a groundwater and surface water monitoring plan shall be approved by the department

(iv) by-products, including residuals, must be removed from the site in a timely manner and disposed of in a manner acceptable to the

department. The storage of these by-products shall not result in any vector, odour or litter problems

(b) The composting facility shall have the following separation distances:

(i) the distance between the active area and the nearest foundation of an off-site structure used for commercial, industrial, residential or institutional purposes shall be a minimum of 100 metres

(ii) the distance between the active area and the nearest property boundary shall be a minimum of 30 metres

(iii) the distance between the active area and the nearest watercourse or water body, including salt water, shall be a minimum of 30 metres

(iv) under certain circumstances, separation distances may be increased or decreased after consultation with the department depending on factors such as environmental controls and local conditions

(v) a separation distance may be decreased by the department pursuant to clause (iv) provided that written consent is obtained by the applicant from all the property owners within the affected area

IV. IN-VESSEL COMPOSTING FACILITIES

1. General

Section IV of the guidelines applies to all in-vessel composting facilities.

2. Receiving and Tipping Area

(a) The receiving and tipping area shall be underlain by an impermeable pad, the surface of which shall be concrete or asphalt. All drainage from the impermeable pad shall be collected for treatment or for return to the process.

(b) The receiving and tipping area shall be in an enclosed structure.

3. Composting Area

(a) The composting area shall be designed to fully contain the compostable organic material and all leachate which may be generated.

(b) The containment system shall be impermeable, the surface of which shall be constructed of concrete, asphalt, steel or other material as approved by the department.

(c) All drainage from the composting area shall be collected for treatment or for return to the process.

4. Curing Area

(a) The curing area shall be underlain by an impermeable pad, the surface of which shall be concrete, asphalt, or other material as approved by the department.

(b) All drainage from the impermeable pad shall be collected for treatment or for return to the process.

(c) All curing areas shall utilize permanent roof structures and/or proven management techniques to control moisture and minimize odour and leachate generation.

5. Leachate Management Systems

(a) A leachate management system shall be developed which consists of infrastructure and monitoring systems designed to collect, monitor, control, and treat leachate prior to being discharged into the surrounding environment. The system shall:

(i) have a leachate collection and removal network in the active area
(ii) function year round
(iii) have a means of monitoring all treated leachate discharges

(b) The discharge standards for all liquid effluent shall be based on the background water quality in the receiving water, identified current and projected uses of the receiving water and the *Canadian Water Quality Guidelines* (as amended from time to time) for protection of these defined water uses. Additionally, liquid effluent shall not be acutely lethal as determined by the suite of Biological Test Methods developed by Environment Canada for this purpose.

6. Surface Water Management

(a) The applicant shall submit for approval from the department a surface water monitoring program. The extent of surface water monitoring requirements will be based on the design of the facility.

(b) The surface water monitoring program shall be designed to do the following:

(i) divert surface and storm water from the active areas
(ii) control run-off discharge from the facility
(iii) control erosion, sedimentation, siltation, and flooding
(iv) minimize the generation of leachate

(See Appendix 1 for an example of a typical surface water monitoring program)

7. Groundwater Management

(a) The applicant shall submit for approval from the department a groundwater monitoring program. The extent of groundwater monitoring requirements will be based on the design of the facility. Should any of the active area not be protected from precipitation with permanently constructed roof structures, then the groundwater monitoring program shall consist of the following minimum requirements:

(i) at least one groundwater monitoring well shall be installed hydraulically above the gradient of the active area and at least three monitoring wells shall be installed hydraulically below the gradient direction

(ii) the monitoring well system shall include a sufficient number of multi-level well nests for measurement of vertical gradients

(iii) locations of the monitoring well(s) shall be sufficiently close to the active area to allow early detection of contamination and implementation of remedial measures

(iv) the monitoring well(s) are to be retained throughout the lifespan of the facility

(See Appendix 1 for an example of a typical groundwater monitoring program)

8. Odour Control Systems

(a) Mechanical ventilation shall be provided for the composting area, areas for the storage of compostable organic feedstock and any other area containing readily putrescible materials such as the storage room for residuals.

(b) All areas referred to in clause (a) shall be under a negative atmospheric pressure in order to avoid the escape of odours.

(c) All ventilation air shall be subject to a treatment system designed to remove odours prior to release into the environment.

9. Separation Distances

(a) The distance between the active area and the nearest residential or institutional building shall be a minimum of 500 metres.

(b) The distance between the active area and the nearest commercial or industrial building shall be a minimum of 250 metres.

(c) The distance between the active area and the nearest property boundary shall be a minimum of 100 metres.

(d) Where it can be demonstrated that particular equipment will not release odours generated from the composting process into the surrounding environment, the distance between the equipment and the nearest property boundary shall be a minimum of 30 metres.

(e) The distance between the active area and the nearest watercourse or water body, including salt water, shall be a minimum of 30 metres.

(f) Under certain circumstances, separation distances may be increased or decreased after consultation with the department. These will depend on factors such as environmental controls (including odour control) and local conditions.

(g) A separation distance may be decreased by the department pursuant to clause (f) provided that written consent is obtained by the applicant from all property owners within the required separation distances.

V. OPEN WINDROW COMPOSTING FACILITIES

1. General

Section V of the guidelines applies to all open windrow composting facilities except leaf and yard waste composting facilities covered under Section III.

2. Receiving and Tipping Area

(a) The receiving and tipping area shall be underlain by an impermeable pad, the surface of which shall be concrete or asphalt. All drainage from the impermeable pad shall be collected for treatment or for return to the process.

(b) The receiving and tipping area shall be in an enclosed structure.

3. Composting Area

(a) The composting area shall be underlain by an impermeable pad, the surface of which shall be concrete, asphalt, or other material as approved by the department. All drainage from the impermeable pad shall be collected for treatment or for return to the process.

(b) All composting areas shall utilize permanent roof structures and/or proven management techniques in order to control moisture and to minimize odour and leachate generation.

4. Curing Area

(a) The curing area shall be underlain by an impermeable pad, the surface of which shall be concrete, asphalt, or other material as approved by the department.

(b) All drainage from the impermeable pad shall be collected for treatment or for return to the process.

(c) All curing areas shall utilize permanent roof structures and/or proven management techniques to control moisture and to minimize odour and leachate generation.

5. Leachate Management Systems

(a) A leachate management system shall be developed which consists of infrastructure and monitoring systems designed to collect, monitor, control, and treat leachate prior to being discharged into the surrounding environment. The system shall:

(i) have a leachate collection and removal network in the active area
(ii) function year round
(iii) have a means of monitoring all treated leachate discharges
(iv) the system must record both instantaneous and total flow volumes

(b) The discharge standards for all liquid effluent shall be based on the background water quality in the receiving water, identified current and projected uses of the receiving water and the *Canadian Water Quality Guidelines* (as amended from time to time) for protection of these defined water uses. Additionally, liquid effluent shall not be acutely lethal as determined by the suite of Biological Test Methods developed by Environment Canada for this purpose.

6. Surface Water Management

Surface water management systems shall be designed to do the following:

(a) divert surface and storm water from the active areas
(b) control run-off discharge from the facility
(c) control erosion, sedimentation, siltation, and flooding
(d) minimize the generation of leachate

(See Appendix 1 for an example of a typical surface water monitoring program)

7. Groundwater Management

(a) To ensure that groundwater is adequately protected, each facility shall include a groundwater monitoring program.

(b) The groundwater monitoring program shall consist of the following:

(i) at least one groundwater monitoring well shall be installed hydraulically above the gradient of the active area and at least three monitoring wells shall be installed hydraulically below the gradient direction

(ii) the monitoring well system shall include a sufficient number of

multi-level well nests for measurement of vertical gradients

(iii) locations of the monitoring wells shall be sufficiently close to the active area to allow early detection of contamination and implementation of remedial measures

(iv) the monitoring wells are to be retained throughout the lifespan of the facility.

(See Appendix 1 for an example of a typical groundwater monitoring program.)

8. Odour Control

(a) Facilities shall provide to the department detailed management techniques for the control of odours from the composting process.

(b) All open windrow facilities which include more than 1000 tonnes annually of food waste in their feedstock or exceed 10 000 tonnes annually of total feedstock, shall provide atmospheric dispersion modelling to determine the potential for odour at the property boundary and other receptors near the facility.

(c) The modelling shall categorize the compounds which could result in odour and shall establish odour concentrations at the property boundaries and other receptors. These baseline odour concentrations shall meet the satisfaction of the department and shall be used in testing for odours after the facility is in operation.

9. Separation Distances

(a) The distance between the active area and the nearest structure, including residential, institutional, commercial or industrial buildings, shall be a minimum of 500 metres. Where the facility includes more than 1000 tonnes annually of food waste in its feedstock, or exceeds 10 000 tonnes annually of total feedstock, then the separation distance shall be a minimum of 1000 metres.

(b) The distance between the active area and the nearest property boundary shall be a minimum of 100 metres.

(c) The distance between the active area and the nearest watercourse or water body, including salt water, shall be a minimum of 30 metres.

(d) Under certain circumstances, separation distances may be increased or

decreased after consultation with the department. These will depend on factors such as environmental controls (including odour control) and local conditions.

(e) A separation distance may be decreased by the department pursuant to clause (d) provided that written consent is obtained by the applicant from all property owners within the affected area.

VI. COMPOSTING FACILITY OPERATION

1. General Requirements

(a) Section VI of the guidelines applies to all composting facilities regardless of the size and type of feedstock processed.

(b) The objective of all composting facilities shall be to incorporate all compostable organic feedstock into the composting process the same day that it is delivered to the site. If some feedstock is not incorporated into the process in the same day, except leaf and yard waste feedstocks only, then it shall be stored in an enclosed area with a mechanical system for the capture and treatment of odorous emissions.

(c) The composting facility shall have constant supervision during the hours that the facility is open.

(d) The composting facility shall accept only the feedstock identified in the approval.

(e) Any residual products associated with the composting operation shall be disposed of in a manner acceptable to the department.

(f) Litter shall be controlled on the entire site.

(g) Exposed areas shall be stabilized to prevent erosion and sedimentation.

(h) Dust shall be controlled to departmental requirements for particulate emissions.

(I) Vectors shall be controlled in accordance with a control plan approved by the department.

(j) Signs shall be placed at the entrance to the site indicating the name of the facility, hours of operation, emergency contact, and the materials acceptable at the site.

2. Operation and Maintenance Manual

(a) An Operation and Maintenance Manual shall be submitted for approval from the department and shall include the following:

(i) record drawings and specifications for the composting facility

(ii) a copy of the approval including Terms and Conditions of the approval for the composting facility

(iii) a complete description of the operational practices and procedures

(iv) measures to control and monitor the aeration of the compost to ensure that the oxygen content in the compost material is sufficient to prevent the composting mass from becoming anaerobic

(v) measures to control the aeration, blending and mixing of the compost to minimize odorous emissions from the composting operation as well as raw material and compost storage

(vii) monitoring programs including sampling protocols, locations and frequency for monitoring wells, leachate treatment and storm water management systems

(viii) contingency plans

(b) The Operation and Maintenance Manual shall be left on site at all times and shall be available for inspection during operating hours.

3. Contingency Plans

(a) Contingency plans shall identify all reasonably foreseeable emergencies including a fire, explosion, leachate leakage or spills and shall describe appropriate response to prevent an adverse affect on the surrounding environment.

(b) The applicant shall provide contingency plans addressing problems associated with vectors, groundwater contamination, equipment failure, and odour generation and complaints.

4. Reports and Records

(a) The type and frequency of monitoring and reporting requirements shall be specified in the terms and conditions of the approval.

(b) The applicant shall submit for approval from the department an annual report which shall include the following information:

(i) liquid effluent (leachate) monitoring both pre-treatment and post-treatment including:
  (a) flow volumes
  (b) leachate quality

(ii) surface water monitoring and groundwater monitoring quality data

(iii) feedstock flow including:
  (a) types of materials accepted at the composting facility for the period
  (b) quantities of materials accepted at the composting facility for the period
  (c) quantities of materials composted
  (d) quantities of materials rejected and sent for disposal

(iv) compost quality testing results

(v) complaint records

(c) The applicant shall record and respond to complaints regarding the composting operation from the neighbouring public. Each complaint and associated measures shall be recorded in a log book including:

(i) a description of the complaint and the date and time it was received by the applicant

(ii) wind direction, wind speed, temperature, humidity and other atmospheric conditions at the time of the occurrence which resulted in a complaint

(iii) a description of the measures taken to address the cause of the complaint

VII. COMPOST CLASSIFICATION AND USE

1. Compost Classification

(a) All compost will be classified in accordance with the criteria identified in the Canadian Council of Ministers of the Environment (CCME) document *Guidelines for Compost Quality* dated October 2005 as amended from time to time. The compost must meet all criteria as established for foreign matter, maturity, pathogens and trace elements. See Schedule B for table

of trace elements.

(b) Testing of the compost quality shall be completed for every 1,000 tonnes of compost produced or every three months and conducted in accordance with the minimum testing procedures identified in Section 4 of the CCME Guidelines.

(c) Compost which meets the criteria established in the CCME Guidelines as Category B shall be classified in accordance with metal concentrations, product maturity, amount of foreign matter, organic matter content, pH and salinity.

(d) Compost which is tested and classified as a hazardous or special waste shall be handled and treated in accordance with the requirements of the *Act*.

2. Compost Use

(a) Compost which meets the criteria established in the CCME Guidelines as Category A may be used in accordance with the uses stated in the CCME Guidelines for Category A.

(b) Use of compost which meets the criteria established in the CCME Guidelines as Category B will be related to the sensitivity of the proposed receiving environment, the various feedstock used to produce the compost and the quality of the final product. Approval for the use of this compost shall include use on forest lands, landfills, highway medians and land reclamation projects such as quarries and disposal site restorations. This compost cannot be used on food crops.

Dated January 31, 2006

Original Signed by:
William Lahey
Deputy Minister

Schedule A

Definitions:

(a) "*Act*" means the *Environment Act*, S.N.S. 1994-95, c.1

(b) "active area" means any area used for transfer, storage, disposal, separation, processing or treatment of compostable material including the tipping area, the composting area and the curing pad

(c) "administrator" means a person appointed by the Minister pursuant to Section 21 of the *Act*

(d) "approval" means an approval pursuant to Section 27 of the *Solid Waste-Resource Management Regulations*

(e) "backyard composting" means composting at a residential dwelling unit of organic solid waste, including grass clippings, leaves or food waste, where

(i) the waste is generated by the residents of the dwelling unit or neighbouring dwelling units or both
(ii) not more than 10 m^3 is processed annually

(f) "biosolids" means organic materials which originated as settled matter in facilities treating municipal or industrial liquid wastes and may be used as feedstock for composting operations

(g) "compost" means a product of composting which is used or sold for use as a soil amendment, artificial topsoil or growing medium or for some other application to land

(h) "composting" means the biological decomposition of organic materials, substances or objects under controlled circumstances to a condition sufficiently stable for nuisance-free storage and for safe use in land applications

(i) "composting area" means an area where organic material undergoes the rapid initial stage of composting

(j) "composting facility" means a solid waste-resource management facility where composting occurs

(k) "compostable organic material" means vegetative matter, food processing waste, landscaping, garden and horticultural wastes, kitchen scraps, feed processing wastes, and other organic wastes which can be readily

composted in composting facilities

(l) "curing area" means an area where organic material that has undergone the rapid initial stage of composting is further stabilized into a mature finished compost

(m) "department" means Nova Scotia Environment and Labour

(n) "food waste" means any residual vegetative waste other than leaf and yard materials or woody materials and residual waste of animal origin including meat, fish, bones, carcasses or shells other than manure or biosolids from residential, industrial, commercial or institutional sources

(o) "foreign matter" means any matter resulting from human intervention and made of organic or inorganic components including metal, glass, synthetic polymers (e.g., plastic and rubber) that may be present in compost but foreign matter does not include mineral soils, woody material, and rocks

(p) "in-vessel composting" means any composting method in which composting materials are contained in an enclosed reactor, vessel or building and which utilizes forced ventilation with treatment of ventilation air for odour reduction

(q) "leaf and yard waste" means vegetative matter resulting from gardening, horticulture, landscaping or land clearing operation, including materials such as tree and shrub trimmings, plant remains, grass clippings, leaves, trees and stumps, but excludes construction and demolition debris or contaminated organic matter

(r) "open windrow composting" means composting in which compostable organic material is open to the atmosphere during the composting process and includes windrow composting in a building but where there is no treatment of ventilation air for odour reduction

(s) "vector" means a carrier organism that is capable of transmitting a pathogen from one facility or waste source to another source, facility, product or organism including rodents, insects and birds

Schedule B

Concentrations of trace elements in compost*:

	CATEGORY A	CATEGORY B
Trace Elements	**Maximum Concentration within Product (mg/kg dry weight)**	**Maximum Concentration within Product (mg/kg dry weight)**
Arsenic (As)	13	75
Cadmium (Cd)	3	20
Cobalt (Co)	34	150
Chromium (Cr)	210	1060**
Copper (Cu)	400	760**
Mercury (Hg)	0.8	5
Molybdenum (Mo)	5	20
Nickel (Ni)	62	180
Lead (Pb)	150	500
Selenium (Se)	2	14
Zinc (Zn)	700	1850

* See CCME *Guidelines for Compost Quality* for maximum cumulative additions to soil.

** See CCME *Guidelines for Compost Quality* for further description of these values.

Appendix 1

Typical Surface and Groundwater Monitoring Program

1.0 SITE ASSESSMENT AND DESIGN

1.1 Hydrogeologic Assessment

Prior to the establishment or expansion of a site, a report shall be prepared by the owner containing plans, specifications, and descriptions of the hydrogeologic conditions of the site, adjacent and nearby properties, and the regional area in which the site is located, including, at a minimum, the following:

.1 a general description of geologic and hydrogeologic conditions occurring at the site, and adjacent and other properties within 1000 m of the site. This description should identify any unstable soils or bedrock, indicate the location and nature of any boundaries to groundwater movement, and characterize the significance of groundwater resources and the use made of these resources

.2 a detailed hydrogeologic investigation of the site which establishes soil, rock, and groundwater conditions

.3 an interpretation of the results of the detailed hydrogeologic investigation of the site, including plans, specifications, and descriptions

.4 an assessment of the suitability of the site considering the regional, local, and site specific hydrogeologic conditions, the design of the site, and the contingency plans for the control of leachate

1.2 Surface Water Assessment

Prior to the establishment or expansion of a site, a report shall be prepared by the owner containing plans, specifications, and descriptions of the surface water conditions of the site, adjacent and nearby properties, and the regional area in which the site is located, including, at a minimum, the following:

.1 a description of the local surface water features occurring at the site, and adjacent and other properties within 1000 m of the site. This description shall include, but not be limited to, flood plains, natural watercourses, waterbodies (including salt water) drainage paths and boundaries, streamflows, surface water quality, and sources of water supply. The description shall also extend further than 1000 m to be sufficiently large to assess the range and extent of potential effects

.2 a detailed surface water investigation of the site to assess water quality, quantity, and habitat conditions of the surface water features identified on site, including existing and potential surface water uses

.3 an interpretation of the results of the detailed surface water investigation of the site, including plans, specifications, and descriptions

.4 an assessment of the suitability of the site considering the regional, local, and site specific surface water conditions, the design of the site, and the contingency plan for the control of leachate

2.0 OPERATION AND MONITORING

2.1 Groundwater Monitoring

A program for monitoring groundwater quality and quantity shall be carried out by the owner and shall include, at a minimum, the following:

.1 Representative samples of groundwater within the site shall be:

a) obtained annually from groundwater monitoring facilities and be analyzed for the parameters listed in column 1 of Schedule 1

b) obtained quarterly from groundwater monitoring facilities and be analyzed for the parameters listed in column 2 of Schedule 1

.2 Where requested by property owners or occupants, representative samples of groundwater shall be obtained from domestic wells located within 500 m of the site at a frequency of 1 sample per well per year and these groundwater samples shall be analyzed for the parameters listed in column 2 of Schedule 1.

.3 The results of analysis of a water sample collected under Subsection 2.1.2 shall be provided to the department and the owner or occupant of the property with the domestic well from which the sample was obtained, within 60 days of obtaining the sample.

.4 The results of analysis of all water samples collected in the groundwater monitoring program, together with an assessment of these results shall be provided to the department in an annual report, and where the assessment indicates a significant increase in contaminant concentrations, within 60 days of obtaining the sample and 5 days of making the assessment.

.5 The parameters to be monitored may be amended where the owner prepares a report showing alternative parameters should be monitored, based on the type of process at the site.

2.2 Surface Water Monitoring

A program for monitoring surface water quality, quantity, and biological features shall be carried out by the owner and shall include, at a minimum, the following:

.1 Representative samples of surface water being discharged from the site and of any waterbody, including upstream control locations, which may be affected by leachate, stormwater runoff, or sediment from the site , shall be:

a) obtained semi-annually, and be analyzed for the parameters listed in column 3 of Schedule 1 and for other parameters of concern identified in the surface water assessment

b) obtained quarterly and be analyzed for the parameters listed in column 4 of Schedule 1

.2 Annual monitoring of biological features to assess the composition and any changes to the benthic community present in any waterbody, located downstream of storm water discharges, that may be affected by leachate, stormwater runoff, or sediment from the site.

.3 The results and assessment of the results of the surface water monitoring shall be provided to the department in an annual report, and where the assessment indicates an increase in contaminant concentrations exceeding the natural variability exhibited by baseline and operational monitoring data, within 60 days of obtaining the sample and 5 days of making the assessment.

.4 The parameters to be monitored may be amended where the owner prepares a report showing alternative parameters should be monitored, based on the type of process at the site.

Schedule 1

Groundwater, Leachate and Surface Water Monitoring Parameters

	Parameter			
Parameter Group	**Column 1**	**Column 2**	**Column 3**	**Column 4**
	Comprehensive List for Groundwater and Leachate	**Indicator List for Groundwater and Leachate**	**Comprehensive List for Surface Water**	**Indicator List for Surface Water**
	Alkalinity	Alkalinity	Alkalinity	Alkalinity
	Ammonia		Ammonia	Ammonia
	Arsenic		Arsenic	
	Barium		Barium	
	Boron		Boron	
	Cadmium	Cadmium	Cadmium	
	Calcium	Calcium		
	Chloride	Chloride	Chloride	Chloride
	Chromium		Chromium	
	Conductivity	Conductivity	Conductivity	Conductivity
	Copper		Copper	
	Iron	Iron	Iron	
	Lead	Lead	Lead	
	Magnesium	Magnesium		
	Manganese			
	Mercury		Mercury	
	Nitrate	Nitrate	Nitrate	Nitrate

Parameter				
Parameter Group	**Column 1**	**Column 2**	**Column 3**	**Column 4**
	Comprehensive List for Groundwater and Leachate	**Indicator List for Groundwater and Leachate**	**Comprehensive List for Surface Water**	**Indicator List for Surface Water**
	Nitrite		Nitrite	Nitrite
	Total Kjeldahl Nitrogen		Total Kjeldahl Nitrogen	Total Kjeldahl Nitrogen
	pH	pH	pH	pH
	Total Phosphorus		Total Phosphorus	Total Phosphorus
	Potassium	Potassium		
	Sodium	Sodium		
	Suspended Solids	Suspended Solids	Suspended Solids	Suspended Solids
	Total Dissolved Solids	Total Dissolved Solids	Total Dissolved Solids	Total Dissolved Solids
	Sulphate	Sulphate	Sulphate	Sulphate
	Zinc		Zinc	
Volatile Organics				
	Benzene		Benzene	
	1, 4 Dichlorobenzene		1, 4 Dichlorobenzene	
	Dichloromethane		Dichloromethane	
	Toluene		Toluene	
	Vinyl Chloride			